TITLE: Those Daring Youong Men and Their Ultra-High-Flying Machines

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THOSE DARING YOUNG MEN AND THEIR ULTRA-HIGH-FLYING MACHINES

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The year: 1957. The task: planning for a deep-penetration U-2 overflight of the Soviet Union. To win the approval of President Dwight D. Eisenhower, who personally checked the flight plans and set the time limits for each operation, the justification for every mission had to be detailed and supported by voluminous mission planning charts and threat analyses.

Most overflight requests that made it to the Oval Office were based on questions of immediate interest: How many intercontinental bombers are in the Soviet arsenal? What is the status of Soviet nuclear test facilities? Where are the Soviet ICBMs being tested? How many airbases within the Soviet Union can be used to deploy heavy bombers? What is the status of the Soviet naval forces? How many submarines do the Soviets have? How extensive is the Soviet power grid east of the Urals? Has the Soviet Union extended its network of highways? Of railroads?

These national intelligence requirements flowed from the various parts of the intelligence community, which was different from the community of today. The Defense Intelligence Agency had yet to be created. In its stead were the G-2 units of the major service components: the Office of Naval Intelligence, the Army's Military Intelligence Service, and the Air Force's Air Intelligence Service. The National Security Agency was still in its infancy. The Federal Bureau of Investigation, the State Department's Bureau of Intelligence Reports, and the Atomic Energy Commission all sent representatives to meetings of the Intelligence Advisory Committee, presided over by the Director of Central Intelligence, Allen W. Dulles. Representatives of the community also brought their wish-lists for overflights to James Q. Reber, chairman of the Ad Hoc Requirements Committee (ARC).

In September 1957 a consensus began to build for obtaining presidential authority for overflights of Soviet naval maneuvers in the Barents Sea area near Murmansk, scheduled for October. Some ARC members wanted an ELINT-collection mission, and others wanted photos of the deployed vessels as well as of the naval shipyards ranged around Murmansk and Severomorsk. The early U-2B, however, could not fly both ELINT and photo payloads at the same time.

Consensus on targets for a mission was only the beginning of the process. The Air Force, which provided the lion's share of the support for these covert U-2 missions, had to produce a long-range weather forecast for the area of the intended overflight. Air Force navigators had to plot proposed flight plans. The Photographic Intelligence Center (PIC) had to provide data on possible targets along the flight path and indicate where the cameras should be turned on and

off. The Lockheed specialists who looked after the U-2 airframes had to be informed of the intended route in order to assist in determining fuel consumption rates and the accuracy of the navigation instruments. A flight to Murmansk would take the U-2 to an area of extreme cold, where gusty winds might be encountered at high altitudes. The aircraft would also have to be navigated at the highest latitudes on earth, where the divergence between magnetic north and true north is most pronounced, where magnetic deflection causes wide variations in magnetic compass accuracy, and where radio beacons are few and far between.

When all ARC members had agreed on the need for overflights in the Murmansk area, Richard M. Bissell, Jr., special assistant to the DCI, persuaded Dulles to approach the President for permission to mount the missions. This permission was not easily obtained. President Eisenhower had been disappointed to learn after the first five overflights in July 1956 that the U-2 was not invisible to radar as he had been led to believe; he was more than disappointed when he received a protest from the Soviet Government giving many details of the first two deep-penetration overflights, made on 4 and 5 July 1956. Eisenhower had been prompt to use the U-2 to overfly much of the Middle East during the Suez crisis in October 1956, but was very reluctant to aggravate the Soviets. By September 1957, only 17 deep-penetration missions had been flown over the Soviet Union, five of them in July 1956 and seven in August 1957. Most were flown by Detachment B, based in Adana, Turkey. The missions to Murmansk would be mounted by Detachment A, based at Giebelstadt, West Germany.

The first step in the authorization procedure was for Bissell to brief the President's staff secretary, Colonel Andrew J. Goodpaster. If Goodpaster thought the President might approve, he arranged for Bissell and Dulles to see him. In this case, there is no exact record of when Eisenhower gave his approval for the Murmansk mission, but it is believed to have been in late September 1957.

ELINT-Collection Mission

President Eisenhower authorized two missions in the Barents Sea area, both to be flown by U-2 Detachment A from its base at Giebelstadt, a former Luftwaffe aerodrome located between Mannheim and Nuernberg. The first mission, No. 2037, was planned for 11 October 1957. It was not a deep-penetration overflight and would not violate Soviet airspace. Its sole purpose was to collect ELINT emissions from the Soviet fleet. The aircraft to be used on this flight, article 351, had just returned to Giebelstadt from the Lockheed plant in Burbank, California, where it had been fitted with the new "slipper" fuel tanks—cylindrical tanks mounted under each wing 10 feet from the fuselage. Each tank held 100 gallons of fuel and extended the range of the U-2s beyond 4,000 nautical miles (nm).

For mission No. 2037, the aircraft was equipped with

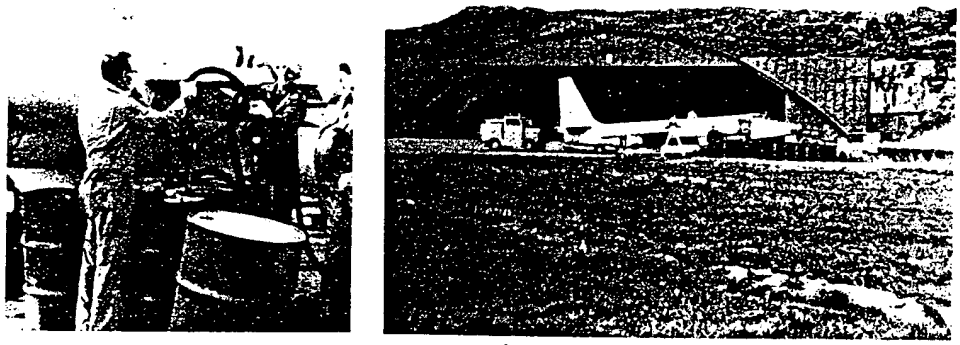
Mission No. 2037 got under way at 05:25 local time (0425Z) in total darkness. The weather was extremely hazardous: a ceiling of 200 feet and visibility of only 220 yards. Piloting article 351 was driver Jacob Kratt, a tall, taciturn, German-speaker from Milwaukee.[1]

He was to overfly the Soviet Union's Northern Fleet as it went through maneuvers in the Barents Sea north and east of Norway. Navigation, as always in these high latitudes, was Kratt's greatest problem. As the sun rose, he saw that everything beneath him was hidden by a low-lying layer of cloud, referred to as "undercast." Kratt therefore had to rely on dead-reckoning navigation, using his radio compass and chronometer to guide his aircraft for almost 4,000 nm.

When he reached Tromso, in extreme northeastern Norway, at 0735Z, Kratt turned on the System-IV unit and began collecting emissions. For the next three and a half hours, article 351 flew a triangular course above the cloud-shrouded Barents, returning to the Tromso turning point at 1101Z. By this time the cloud cover had lifted enough for Kratt to see the Norwegian coast and determine that he was 54 miles south of his planned route. The error was probably caused by winds aloft.

While flying the final leg of the triangle, Kratt spotted contrails, which are formed by hot jet exhaust gases condensing in the cold layer of air just below the tropopause, from what might have been a Soviet aircraft. The U-2 flew 5,000 to 7,000 feet above this layer of cold air to avoid creating contrails, which would have betrayed the aircraft's presence. U-2 drivers could spot other aircraft only when they passed through the contrail layer. Above or below that layer objects as small as fighter aircraft are virtually impossible to detect.

Kratt landed article 351 at Giebelstadt at 15:18 local time (1418Z), nine hours and 53 minutes after takeoff. He had traveled more than 3,900 nm.



Fueling Article 351 about a year after Mission 2040. (S)

[1] For reasons of security and cover, U-2s were referred to as "articles." The CIA had 20 U-2s, which were assigned article numbers 341 through 360. Those who flew the U-2s were referred to as "drivers." These drivers were former Air Force fighter pilots who had been recruited by the Agency specifically for the U-2 program, known at this time by the cryptonym AQUATONE. Generally, drivers were briefed only for the mission to which they were assigned as primary or backup pilot, and had little idea about the types of missions being flown by other detachments or even by their own detachment.

Deep-Penetration Photo Mission

On 13 October 1957, article 351 was again on the runway at Giebelstadt, ready for mission No. 2040, and this time it would penetrate Soviet airspace. On this occasion, the aircraft's Q-bay contained an A-2 camera configuration composed of three 24-inch focal-length cameras—one aimed at the right oblique, another at nadir, and the third at the left oblique. As before, a smaller, 70-mm tracking camera, which operated continuously from takeoff to landing, completed the payload.

While Lockheed technicians made last-minute checks of the various flight systems, Air Force personnel filled the aircraft with JP-7 fuel. This special, low-volatility, low-vapor-pressure kerosene fuel had been developed in 1955 by Shell Oil Company specifically for the U-2 at the behest of General James H. Doolittle, a Shell vice president and a consultant to the U-2 program. JP-7's boiling point of 300° Fahrenheit at sea level kept it from vaporizing when the U-2 reached its cruising altitude 13.5 miles above sea level. This fuel was so viscous that the U-2's designer, Clarence L. "Kelly" Johnson, called it "cough syrup." On 13 October, 1,535 gallons were emptied into article 351. This amount becomes a critical factor in the story of mission No. 2040. To understand why, it is necessary to know some unusual characteristics of this aircraft.

When Kelly Johnson designed the U-2, he was striving for the ultimate in high-altitude performance. To accomplish this, he had to devise a means to store large amounts of fuel within the airframe. His solution was to use what is known as a "wet" wing: all the cavities within the inner two-thirds of each U-2 wing were made leakproof and filled with fuel. By employing a wet wing, however, Johnson was not able to provide the U-2 pilot with the traditional full-empty fuel gauge, because the fuel had to be drained simultaneously from both wings to preserve aircraft balance.

Johnson's method of alerting the pilot to fuel consumption was cumbersome, but effective—if everyone followed the rules precisely. On the U-2's instrument panel was a fuel counter that was set manually by the person responsible for fueling the aircraft. This counter was set to the precise number of gallons pumped into the aircraft. The fuel from the wings was fed by gravity to a central sump located ahead of and below the cockpit. As each gallon of fuel was fed from this sump to the engine, a metering device sent an electric pulse that caused the counter to be reduced by one digit.

Before each flight, Detachment A's navigation unit prepared a flight plan on an 8.5-by-11-inch green card that listed each turning point in the flight and gave an estimated time of arrival at each point and an estimate of fuel usage based on the amount put into the aircraft by the ground crew. The U-2 driver was responsible for writing on his green card the time of arrival at each turning point and the reading of the fuel counter. The driver also carried a strip map of the area over which he was to navigate.

Mission No. 2040 was to be flown by Hervey S. Stockman, a pilot who had begun flying in World War II and had first seen the Giebelstadt airfield from the cockpit of a P-51 Mustang in 1945. His main mark in history: he had made the first U-2 overflight of the Soviet Union on 4 July 1956.

Murphy's Law

Stockman's concern as he climbed into article 351 was primarily with the weather—Giebelstadt was covered with fog so low that he could not see the top of the U-2's rudder—and he failed to check the fuel figures on his green card with the numbers showing on the fuel counter. It was just after 0500Z when he settled into the cockpit, got his oxygen supply switched over from the prebreathing pack to the onboard system, and plugged in his radio cables. U-2 drivers wore bulky partial-pressure flight suits over which was a coverall to protect the suit itself from snags and abrasions. This clothing made all movement clumsy.

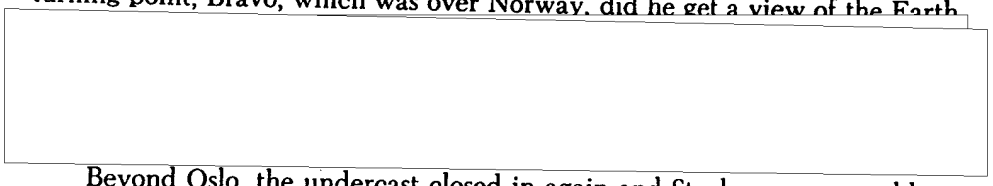
At 0535Z, Stockman began his takeoff roll down a runway on which he could barely see the white center stripe. Once airborne, at an altitude of 4,500 feet the U-2 broke into the sunlight. It was then that Stockman noted that the cockpit was hot and that a film of oil could be seen creeping up the canopy's left quarter-panel from a forward vent. He moved the air temperature setting to cooler, but it had no effect. He moved it back and forth several times, but the result was the same: hot, oily air.

During this time, Stockman was trying to get his craft to altitude, a tedious chore when the U-2 was filled with fuel. It was critical that he keep the wings level because, as fuel was expended, one wing would sometimes feed the fuel quicker than the other and disturb the U-2's balance. To regain balance, the driver had to activate pumps to move fuel from one wing to the other. Eventually, the heat in the cockpit became so great that Stockman broke radio silence and asked Giebelstadt what to do; he was told to pull the circuit breaker. To reach the device, located on a panel to the right and below the level of his seat, Stockman had to release his shoulder harness. He then had to use his hands to turn his heavy helmet so that he could see the circuit-breaker panel and find the proper breaker. Once he had disabled the air-conditioning system, the mist of oil stopped flowing from the canopy vents.

Again, this problem was a result of the U-2's design. The air-conditioning system used "bleed" air from the jet engine's first-stage compressor. During takeoff, some of the early J-57 engines tended to "throw" oil, which would be converted to mist by the compressor and would enter the cockpit via the cooling system. Without the air conditioner, Stockman could expect the cockpit to become quite cold as the aircraft passed through the tropopause. A half-hour later, Stockman plugged the circuit breaker back into the panel and the air conditioner began functioning normally.

Meanwhile, no sooner had Stockman solved the air-conditioning problem than the U-2 began running rough and losing altitude. Stockman checked his instruments; his altitude was 62,000 feet and dropping, his airspeed was indicated as 124 knots (kts), and his exhaust-gas temperature (EGT) was fluctuating around 600° Fahrenheit, approaching the critical point where the engine could be damaged. Then he noticed that the speed brake switch, a toggle device atop the throttle lever, was in the deployed position. He hastily switched it to the off position and the shuddering stopped. Apparently, during his struggles to unplug the circuit breaker, a pocket on the upper left arm of his coverall had snagged the switch and activated the speed brakes. These are panels aft of the wings on each side of the fuselage that are deployed hydraulically to create drag. They were essential in bringing a U-2 down from its maximum altitude but were out of the driver's line of sight.

Although he was flying in bright sunlight, everything beneath Stockman's aircraft was hidden from view by undercast. Not until he reached his second turning point, Bravo, which was over Norway, did he get a view of the Earth



Beyond Oslo, the undercast closed in again and Stockman was unable to see the terrain below. By the time he reached his fourth turning point, Echo, he noted that his fuel consumption was much greater than predicted on the green card. He was barely a third of the way into the mission and already he was 92 gallons behind the fuel curve. That indicated a shortfall of more than 300 nm. This shortage of fuel worried Stockman for the remainder of the mission, because it suggested he was encountering strong head winds. Normally, winds that strong would affect the handling of the aircraft, but Stockman had experienced little difficulty in that regard. What he did not know was that the crewman who fueled article 351 that morning had made an error in setting the fuel counter on the instrument panel. Instead of indicating 1,535 gallons, the crewman had set the counter to 1,500. But Stockman, concerned about the weather, had failed to note this mistake. At turning point Able the fuel appeared to be 85 gallons short, and at turning point Echo, 92 gallons. In reality, the fuel was only 57 gallons behind the curve.

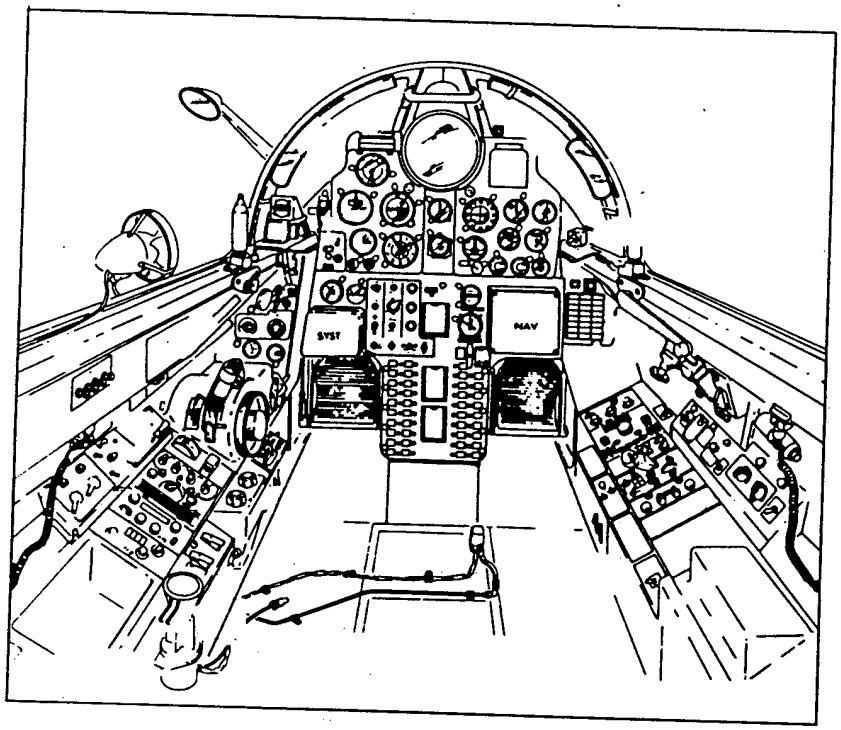
From an altitude of 13 miles, a U-2 driver can see almost 300 miles in every direction. Halfway to his next turning point, Fox, Stockman could see that the undercast extended all the way to turning point George. He decided to shorten his flight and head directly for his next turning point, How, where he could see a break in the undercast. That reduced his flying time by about half an hour and he hoped it would save enough fuel to enable him to complete the mission.

At approximately 0920Z, Stockman guided the U-2 past the northeasternmost coast of Norway and headed due east. It was at this time that Soviet radar began "painting" his aircraft, which it would continue to do for the next two hours. Flying over the Barents Sea to a point 125 nm north of the Soviet city of Gavrilovo, Stockman turned south in an arc that took him about 10 nm from the coast at 0950Z. As he turned west Stockman switched on his cameras. After

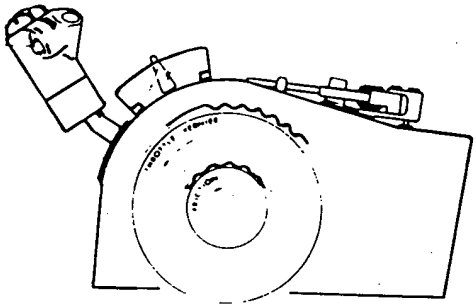
paralleling the coast to a point 20 nm north of Kildin Island, Stockman turned southwest to begin the penetration part of his overflight. It was 1000Z when he began to overfly the Kilskiy Peninsula, headed for the Soviet naval facilities at Severomorsk. Stockman's altitude was 70,200 feet as he passed above Severomorsk and headed his aircraft for Olenegorsk, 50 nm to the south. Enroute he passed five miles to the east of Murmansk, where he saw through the U-2's "hole in the floor" three large ships, which he took to be cruisers, anchored off the port of Grosnyy. He also spotted 15 to 20 destroyers and numerous new airfields in the region.

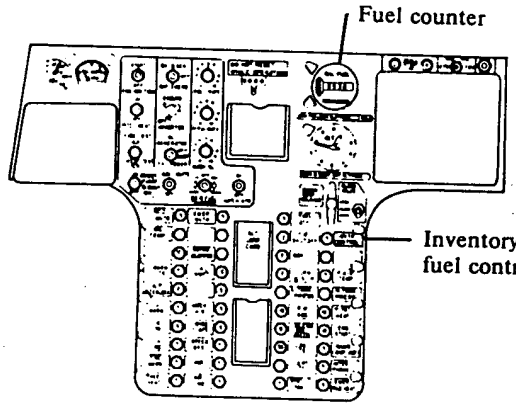
US U-2 Mission 2040, 13 October 1957

Cockpit Details



Throttle





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The "hole in the floor" was a unique feature of the U-2. Because U-2 drivers had to maintain a wings-level, nose-up attitude when flying at maximum altitude, they were unable to see the ground directly beneath the aircraft without the help of a device known as a drift sight. This was essentially an upside-down periscope that permitted a driver not only to look straight down, but to traverse through 360 degrees as well. In addition, there were two levels of magnification.

Soviet Intercept Attempt

After passing Olenegorsk at 1009Z, Stockman put his aircraft into a wide, right-hand turn to head toward Monechegorsk. As he started this turn he saw contrails from two aircraft coming up through the tropopause at a 10-o'clock position from the direction of the Soviet city of Afrikanda. Enemy contrails were startling at an altitude of 13 miles. Above a U-2 flying at this altitude, at the outer edge of the atmosphere, the sky was deep black. This caused a "fish-bowl" effect so that images passing beneath the aircraft were reflected in the curved plastic canopy above the driver's head, and the attacking aircraft appeared to be coming from above and to be much closer than they actually were.

Stockman estimated that had the Soviet planes been able to continue their rate and angle of climb they would have been on a collision course with his U-2. He swung the drift sight around to get a closer look at the Soviet interceptors and managed to locate one of the planes. He was unable to identify it positively by type, because its climbing angle was so great, but he thought that it was a MiG-19; he knew that a MiG-19 squadron was based at Afrikanda. Stockman estimated that the Soviet fighter was at about 55,000 feet when at 1018Z it passed about three miles below the U-2, turned, and began flying parallel with him.

During much of the mission, Stockman experienced trouble with his EGT gauge, which periodically fluctuated wildly. This gauge was used in conjunction with the engine-pressure-ratio (EPR) gauge to fly a U-2 at maximum

Soviet MiG-19 flying northeast below Article 351. (S)

altitude. Here the story of mission No. 2040 becomes more complicated. Kelly Johnson's plane represented the ultimate in subsonic, high-altitude aircraft. It cruised at the absolute physical limit of altitude attainable without compressing, via supersonic flight, the air molecules available in the upper troposphere and lower stratosphere. There was simply not enough air density to permit the U-2 to fly higher.

Keeping the original U-2s at these high altitudes depended on a driver's ability to monitor a number of indicator gauges and make adjustments to keep the critical elements at their optimum output, with only a small margin for error. The critical factors were airspeed, angle of attack, and engine pressure and temperature. Airspeed was the most difficult to control, because the U-2 in a nose-down attitude tended to gain speed rapidly and it became very unsafe at any speed over Mach 0.80.

Unlike standard Air Force fighter aircraft, the U-2 could not withstand great stress. Because of this, a warning was affixed to the instrument panel instructing the pilot not to fly the aircraft faster than 170 kts indicated air speed (IAS) [2] at sea level or 220 kts IAS with gust control on. The gust control forced the aircraft into a nose-up attitude, which stiffened the wings and permitted the plane to withstand wind gusts of up to 50 kts. It also caused drag and increased fuel consumption. If this warning was ignored, the first U-2 aircraft would literally come apart. The U-2B's empennage—that part of the aircraft aft of the engine comprising the vertical and horizontal stabilizer assembly—was held on by only three high-tensile bolts and separated abruptly at speeds over Mach 0.80. Unlike other military aircraft, whose wings have spars running from wingtip to wingtip through the fuselage, the U-2's wings were simply bolted to the fuselage formers and had no continuous central spar. They, too, tended to fall off above Mach 0.80. Johnson used the bolted-on wings in order to reduce weight and gain room for the Q-bay and its payload.

The U-2 driver also had to worry about going too slow. Should his airspeed fall below 98 kts IAS at altitude, the U-2 would stall and fall out of the sky. This is the so-called coffin-corner.

In the less dense atmosphere at high altitudes the U-2 could exceed its 220-kt sea-level speed limit but could not fly faster than Mach 0.80, or approximately 420 kts true air speed (TAS). U-2 drivers tried to maintain an airspeed of Mach 0.72 or approximately 400 kts TAS, which was registered as about 100 kts on the U-2's IAS indicator, a 4-to-1 inverse ratio. The airspeed indicator had two needles: a black one for IAS, and a yellow one for Mach. Mach speed is influenced by air temperature and pressure and thus varies with altitude as well as global location. The U-2B's airspeed "window" was very narrow. At maximum altitude, should the IAS fall below 98 kts, the U-2 experienced stall buffet; above 102 kts IAS it experienced Mach buffet—the

[2] Although airspeed was critical, the indicator that measured it was inaccurate. This was so because airspeed is determined by a pitot tube, protruding from a wing, which essentially measures variations in air pressure and translates this into knots. This reading, known as indicated air speed, is accurate only at sea level. As the atmosphere becomes less dense at higher altitudes, the indicator grows more inaccurate and shows progressively slower speeds than those the aircraft is actually achieving.

coffin-corner effect. In either case the aircraft began to shudder, a preliminary warning that it might do something drastic like shed its wings or fall out of the sky. U-2 drivers had to keep a close watch on the airspeed indicator, because the shuddering at low or high speed was the same and it was critical that no sudden correction be made that might cause the craft to exceed its limits.

At the same time, the U-2's power plant was less responsive at high altitudes. Owing to the reduced air density above 60,000 feet, the Pratt & Whitney J-57 engine generated only 6 percent of the thrust it produced at sea level. Of course, with the reduced atmospheric drag at high altitude and the sleek fairing of the U-2's fuselage and wings, this reduced thrust was more than ample to push the aircraft through the sky at Mach 0.72. In fact, at 70,000 feet the J-57 was throttled back to about 90 percent of power. This power setting was so critical that the U-2 was the only aircraft with a vernier adjustment on the throttle.

Once the U-2 reached maximum altitude and optimum speed, the next problem the driver faced was to keep the engine from overheating and the EPR—the difference in pressure between the air intake and the exhaust—at the optimum 2.95 to 3.10 reading in order to achieve maximum efficiency. If the engine overheated, it would have caused problems with the hydraulic system. If the EPR rose or fell too much, fuel consumption could have risen dramatically.

When article 351's EGT gauge began fluctuating as much as 40 to 50 degrees, Stockman had more reason for concern. He was over hostile territory with untrustworthy instruments. He kept close watch on the EGT, noted every fluctuation on his green card, and watched the tachometer, which measured engine RPMs and could be used as another, though less reliable, measure of engine performance.

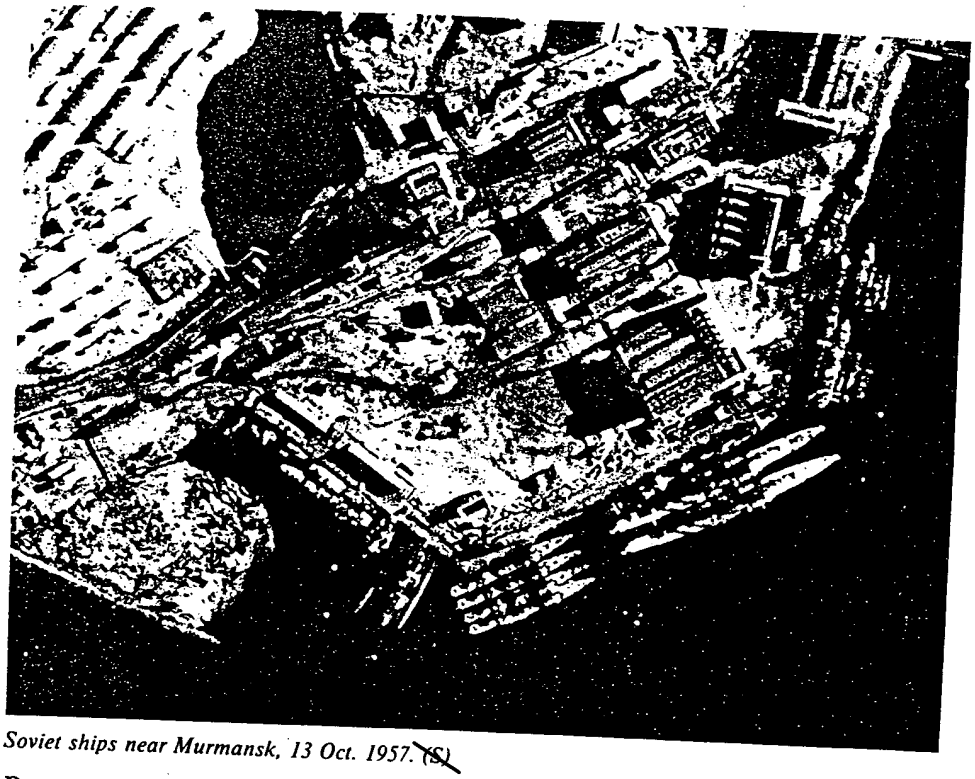
After passing Monechegorsk, Stockman headed north-northwest to a point between Salmiyarvi and Pechenga in the extreme northwest corner of the Soviet Union's Petsamo area. The U-2 exited Soviet airspace about 15 nm west of the Rybachiy Peninsula at approximately 1100Z and headed west up Norway's Veranger Fjord.

Having safely overflown the Soviet Union for one hour, all that remained for Stockman was to nurse article 351 and its fluctuating EGT gauge back to Giebelstadt—a boring, four-hour flight. By the time Stockman reached the German Baltic coast, the undercast had mostly cleared away and he could see as far as England. However, as he approached Giebelstadt it closed in again.

Stockman's final challenge was to get the U-2 down from altitude, a far more complex operation than simply pushing the yoke forward and pointing the nose at the Earth. In a nose-down attitude the U-2 accelerated rapidly and the Mach needle got perilously close to the Mach 0.80 dangerline. Thus, the driver had to rely on the speed brakes. He had to keep the craft within the 98- to 102-kt window in order to avoid stall and, at the same time, lose altitude. His first action was to deploy the speed brakes and then ease back on the throttle's vernier setting. Next, he lowered the landing gear to create even more drag and slow his descent to about 1,200 feet per minute until he passed through the tropopause and reached heavier air.

When the U-2 got below 40,000 feet, the IAS indicator moved rapidly toward the 170-kt placarded speed limit, but the resistance of the atmosphere against the speed brakes and the landing gear also increased, which permitted a more rapid descent for the last part of the let-down sequence.

When his aircraft reached 2,500 feet, Stockman entered heavy cloud. He broke out of this cloud at an altitude of just 400 feet and spotted the Giebelstadt runway three-quarters of a mile ahead. By this time his fuel discrepancy had been reduced to 45 gallons, 35 of which was crew error. Stockman landed article 351 with its valuable film record of the Soviet Northern Fleet facilities at 1452Z, nine hours and 17 minutes after takeoff. Mission No. 2040 was the last penetration overflight of the Soviet Union conducted by Giebelstadt's Detachment A.



Soviet ships near Murmansk, 13 Oct. 1957. (S)

Postscript

Hervey Stockman left the U-2 program in December 1957 and rejoined the Air Force. His first assignment was with the 95th Fighter-Interceptor Squadron at Andrews AFB flying F-102 Delta Daggers. After additional assignments flying high-performance fighters, Stockman was sent to Da Nang, South Vietnam, in late December 1966. He was assigned to the 366th Fighter Squadron and began flying F4 Phantoms. During the next six months, Stockman flew approximately 60 sorties as far north as the Chinese-Vietnamese border.

The F4 Phantoms were flown to protect F-105 Thunderchiefs, being used as dive bombers, from attack by MiG-21s. During these missions, the F4s, in groups of four, would fly in a controlled and close formation at an altitude of 18,000 feet, which was designed to avoid interdiction by the deadly SA-2 Guideline surface-to-air missile used by North Vietnam's defenders.

During an F-105 bombing mission against the major Vietnam-China railroad north of Hanoi on 11 June 1967, Stockman's F4 was involved in a midair collision with another F4. Both he and his radar operator, Ronald Webb, ejected from their crippled aircraft and parachuted, unhurt, into hostile territory. The pilot and radar operator of the other aircraft were killed. Stockman and Webb were captured separately and taken to the Hoa Lo prison in the middle of Hanoi. They never saw each other during their lengthy incarceration in the "Hanoi Hilton," as it was called. Both men spent five years and nine months in Hoa Lo and were freed on 4 March 1973. Stockman now lives in Albuquerque, New Mexico.

As for article 351, the U-2 Stockman flew on 13 October 1957, it was used in another deep-penetration overflight of the Soviet Union on 6 December 1959. During that mission, it overflew Kuybyshev and the Soviet missile test area at Kapustin Yar. Then, on 1 May 1960, when Francis Gary Powers took off from Peshawar in article 360 on his ill-fated attempt to overfly the Soviet Union from border to border, article 351 flew a diversionary mission along the Soviet-Afghan border. Following Powers's shootdown, President Eisenhower ordered a standdown of all U-2 activities. This order caught article 351 on the ground at Detachment B's Adana base. It was rolled into a hangar and remained there until November 1960, when it was ignominiously disassembled, packed in crates, and flown back to the United States aboard a C-124.

One of Eisenhower's last acts as President was to authorize the transfer of two U-2s to the Nationalist Republic of China in early January 1961. Article 351 was one of those two aircraft. It met a fiery end on 19 March 1961 when a Nationalist Chinese pilot, making practice landings at Taiwan's Tao Yuan airfield, permitted a wing to get too low and article 351 stalled over the end of the runway and crashed, killing the pilot and destroying the airframe.

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This article is classified ~~SECRET~~.